

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 07/20/2011 has been entered.

Response to Amendment

The Examiner acknowledges the amending of claims 1, 2, 8, and. 9.

Response to Arguments

Applicant's arguments filed 01/20/2011 have been fully considered but they are not persuasive.

The Applicant has argued Yamada does not teach the outlined claim elements of the resonator structure to be stacked in order.

The Examiner does not agree. As outlined in the rejection below, Yamada teaches a first electrode, an electron hole layer, a light emitting layer, an electron transport layer (previous 3 all part of #13, also see Response to Arguments in the Final office action mailed 05/28/2010 for positioning of the electron transport layer), and a second electrode (fig.19, element #'s outlined below). The Applicant's arguments make mention of a passivation film and color filter of Yamada. The Examiner notes that the claim does not say the color filter is part of the resonator, or that there can be no

intervening layers, only that the layers must be in the stated order. Yamada therefore teaches the claimed limitations.

The Applicant has argued that although Yamada may teach the same equation as that claimed, it is not applied in the same way as Yamada does not disclose a phase relationship between the outlined reflection layers.

The Examiner first notes that Yamada does teach the claimed equation. Further, Yamada has been shown to teach all of the claimed structural features of the instant invention, such that the relationship outlined by the equation must therefore hold and is evidenced by the abstract which states that L is the measure between the reflection layers that is similarly outlined in the claims. Lastly, Yamada need not outline the relationship between phase or other measures between each layer for the equation to hold true.

The Applicant has argued at page 9 of the Remarks that the Examiner is reading more from Yamada than is taught, as Yamada only specifically identifies the layer #13 to be of low reflection.

The Examiner does not agree. In the cited passage Yamada is clearly stating the cavity region should be of low reflectance to outside light. One of ordinary skill in the art recognizes that a cavity is formed via reflectors and the material between the reflectors. This means the cavity is of the layer #13 and the outlined reflection layers. Not only is the cavity in particular desired to have a low reflectance to outside light but the entire device is desired to be of the low reflective property. The motivation to therefore make both of the reflectance layers (both parts of the cavity and the device as a whole) of

substantially the same low reflectance to outside light (20% or less as claimed) is believed to be both obvious and reasonable to one of ordinary skill in the art.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 4, 5, 11, and 12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The independent claims include language stating the second electrode acts as a semi-transparent reflection layer. Claims 4, 5, 11, and 12 state that a semi-transparent reflection layer with a refractive index less than 1 is found on the electrode. The Examiner notes [0068] of the Applicant's specification (PGPUB 2004/0156405) which points out that either the second electrode can be of 1 layer with the above characteristics, or be formed of two layers, one of which is the semi-transparent reflection layer. The current claims appear to now be mixing the two exclusive electrode teachings.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 2, 4-5, 8-9, and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (US 7102282).

With respect to claim 1, Yamada teaches a light emitting device comprising a driving substrate (fig.19 #11), a resonator structure (fig.19 L) comprising, stacked in this order, a first electrode (fig.19 #12) on the driving substrate, an electron hole transport layer on the first driving substrate (col.6 lines 37-42), a light emitting layer (fig.19 #13c) on the electron hole transport layer, an electron transport layer on the light emitting layer (col.6 lines 37-42, see Response to Arguments above), a second electrode (fig.19 #14, taught to form cathode, col.53-57) on the electron transport layer; and a color filter disposed over the second electrode (fig.19 #20), , the second electrode acts as a semi transparent reflection layer (col.6 lines 53-57), the resonator structure resonates light

generated in the light emitting layer and is extracted from at least the second electrode side of the resonator, both of the first and second electrodes reflect outside light at substantially the same strength (col.7-8 lines 49-5 describe the first and second electrode materials (refractive index) and thicknesses are chosen such that the phase portion of the disclosed formula is satisfied; further, col.12 lines 48-64 describes that the cavity formed of #13, as well as the bounding electrodes, is of a composition such that external light is prevented from being reflected, meaning no reflection from either electrode). Yamada further emphasizes the reflectance of the outside light at the resonant wavelength is minimized (col.12 lines 56-64, transmittance very high) in the cavity (includes electrodes). Yamada does not specify the reflectance from the electrodes making up the cavity to be 20% or less. It would have been obvious to one of ordinary skill in the art at the time of the invention to adjust the electrode reflectance to 20% or less as Yamada makes clear that reflectance of outside light is of great importance to improving device operation (see also figs.20-22 for results of external light reflection reducing steps taken).

With respect to claim 2, Yamada teaches that of claim 1, and the use of the stated formula (abs.).

With respect to claims 4 and 5, Yamada teaches a semi-transparent reflection layer (fig.4 #14) is provided on the second end, and has an extinction coefficient of 0.5 or more and a refractive index of 1 or less (since is made of Mg/Ag alloy).

With respect to claims 8-9, Yamada further teaches multiple display devices (col.2 lines 44-51).

With respect to claims 11 and 12, Yamada teaches a semi-transparent reflection layer (fig.4 #14) is provided on the second end, and has an extinction coefficient of 0.5 or more and a refractive index of 1 or less (since is made of Mg/Ag alloy).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TOD T. VAN ROY whose telephone number is (571)272-8447. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Stultz can be reached on (571)272-2339. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tod T Van Roy/

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Primary Examiner, Art Unit 2828